Smithsonian
National Museum of Natural History

Deep Sea 3D

Science Concepts and Corresponding State Standards

Science Concepts

- Ecosystems, community, habitats (coral reef, kelp forest)
- Physical adaptations: camouflage, venom, immunity to venom
- Behavioral adaptations: safety in numbers, warning displays, nocturnal
- Relationships: predator/prey, symbiosis
- Human impact on ocean communities

Standards

Washington, D.C.

- 1st Grade
  - 1.4.3 Observe and explain that animals eat plants and/or other animals for food.
- 2nd Grade
  - 2.8.1 Recognize and explain that living things are found almost everywhere in the world in habitats such as the oceans, rivers, rainforests, mountain ranges, arctic tundra, farms, cities and other environments. Recognize some habitats are extreme, such as the very deepest part of the oceans or inside hot springs.
  - 2.8.2 Recognize that the numbers and types of living things can vary greatly from place to place.
- 5th Grade
  - 5.9.1. Explain that in any particular environment, some kinds of plants and animals survive well, some do not survive as well, and some cannot survive at all.
  - 5.9.3 Explain how organisms can cause changes in their environment to ensure survival, and these changes may affect the ecosystem.
  - 5.9.5 Explain how changes in an organism's habitat are sometimes beneficial and sometimes harmful and changes in the environment have caused some plants and animals to die, migrate or become extinct.
- 7th Grade
  - 7.8.1 Recognize that in all environments organisms with similar needs and living strategies compete with one another for resources, including food, space, water, air and shelter.
  - 7.8.2 Describe how two types of organisms may interact in a competitive or cooperative relationship, such as producer/consumer, predator/prey, parasite/hosts, or as symbionts.
  - 7.8.7 Describe how, as any population of organisms grows, it is held in check by one or more environmental constraints.
- Biology
  - B.8.3 Explore and explain how changes in population size have an impact on the ecological balance of a community and how to analyze the effects.

- Environmental Science
  - E.3.4 Understand and describe that ecosystems tend to have cyclic fluctuations around a state of rough equilibrium, and change results from shifts in climate, natural causes, human activity or when a new species or non-native species appears.
  - E.3.5 Know that organisms may interact in a competitive or cooperative relationship, such as producer/consumer, predator/prey, parasite/hosts, or as symbionts and explain how these interactions contribute to the stability of an ecosystem.
  - E.3.11 Describe how adaptations in physical structure or behavior may improve an organism's chance of survival and impact an ecosystem.
  - E.4.2 Demonstrate how resources, such as food supply, the availability of water and shelter, influence populations.
  - E.4.4 Describe the effect of overpopulation, the role of predators in maintaining ecosystem stability, and methods of population n management.

Maryland

- 4th Grade
  - 3.D.1.b Explain that the characteristics of an organism affect its ability to survive and reproduce.
  - 3.F.1.a,b Explain ways that individuals and groups of organisms interact with each other and their environment.
- 5th Grade
  - 3.A.1. Explain the idea that in any particular environment, some kinds of plants and animals survive well, some less well, and some cannot survive at all.
  - 6.B.2 Explain how human activities may have a negative consequence on the natural environment.
- 6th Grade
  - 3. D.1.e Describe ways in which changes in environmental conditions can affect the survival of individual organisms and entire species.
  - 3.F.1.a,b,c Give reasons supporting the fact that the number of organisms an environment can support depends on the physical conditions and resources available.

Virginia

- 1st Grade
  - 1.5 Investigate and understand that animals, including people, have life needs and specific physical characteristics and can be classified according to certain characteristics.
- 2nd Grade
  - 2.5 Investigate and understand that living things are part of a system.
- 3rd Grade
  - 3.4 Investigate and understand that behavioral and physical adaptations allow animals to respond to life needs.
  - 3.5 Investigate and understand relationships among organism in aquatic and terrestrial food chains.
  - 3.6 Investigate and understand that environments support a diversity of plants and animals that share limited resources.
  - 3.10 Investigate and understand that natural events and human influences can affect the survival of species.

- 4th Grade
  - 4.5 Investigate and understand how plants and animals in an ecosystem interact with one another and the nonliving environment.
- 5th Grade
  - 5.6.c Investigate and understand characteristics of the ocean environment including biological characteristics.
- Life Science
  - LS.7 Investigate and understand that organisms within an ecosystem are dependent on one another and on nonliving components of the environment.
  - LS.9 Investigate and understand interactions among populations in a biological community.
  - LS.10 Investigate and understand how organisms adapt to biotic and abiotic factors in an ecosystem.
  - LS.12 Investigate and understand the relationships between ecosystem dynamics and human activity.
- Biology
  - BIO.9.d Investigate and understand dynamic equilibria within populations, communities, and ecosystems including the effects of natural events and human activities on ecosystems.